UPSTREAM
HIGH EFFICIENCY
GAS WATER HEATER
PROGRAM

Local Energy Efficiency
Program Proposal

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Submitted by:

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1. PROGRAM OVERVIEW

ADM Associates, Inc. (ADM) is proposing to implement an Upstream High-Efficiency Gas Water Heater Program as a Local Residential Energy Efficiency Program for Program Years 2002 and 2003. The Upstream High-Efficiency Gas Water Heater Program that we are proposing is a continuation and extension to other areas of a similar program that ADM has been implementing for Southern California Gas Company (SoCalGas) since 1999.

1.1 BRIEF DESCRIPTION

The goal of the Upstream High-Efficiency Gas Water Heater Program is to increase demand and expand the sales of high-efficiency gas water heaters (i.e., gas water heaters with a energy factor of 0.61 or higher) in the residential replacement market. (Water heaters sold for new construction are excluded from the program.) Based on our market research and the upstream gas water heater program that we have been implementing for SoCalGas, we have developed a program plan through which wholesalers participating in the Upstream High Efficiency Gas Water Heater Program are offered a $10 per water heater incentive to stock high efficiency gas water heaters (i.e., water heaters with energy factors of 0.61 or higher). Of this $10 incentive, $7 is to be passed along as an over-the-counter discount to the plumber and $3 can remain with the wholesaler to cover his administrative costs.

Based on our experience with the SoCalGas program, we are here proposing to implement the Upstream High-Efficiency Gas Water Heater Program to continue to promote sales of residential high efficiency gas water heaters in the service territory of SoCalGas and to extend the program to the service territory of PG&E. These areas are shown in a map provided in Section 3 (regarding customer eligibility). The funding for the program is gas surcharges.

The essential features of our proposed Upstream High-Efficiency Gas Water Heater Program are as follows:

- We provide incentives to wholesalers/distributors to encourage them to purchase, inventory and promote high efficiency gas water heaters.
- We coordinate with manufacturers to provide them with a complete understanding of the program and its goals and objectives; to alert them of intended increased activity throughout the targeted market areas; to integrate with their existing networks; to conduct joint events to increase awareness and education; to entice their support in getting the message out and to actively and enthusiastically participate; and to work with them to facilitate lower prices.

- We communicate with other residential programs to encourage partnering of networks and resources.
- We enlist the participation of sellers and train their staffs on the background of the program, on its goals, objectives, and the benefits to those participating; how to sell high efficient gas water heaters; and where to call to get further information.
- We provide on-going support through periodic site visits to the most active wholesalers/distributors. We conduct on-going support to facilitate continuing purchases of qualifying units by the wholesalers/distributors, to reinforce the program message, to train new employees, to mitigate problems, to seek insight into program acceptance and participation, to refresh point-of-purchase materials, and to gain feedback on improvement strategies
- We provide on-going remote support to sellers who desire to participate and who are less able to make significant contributions to the program goals.
- We provide a Web Site to list the participating sellers; to describe the benefits of high efficient water heaters; to calculate the savings that are realized from an increase in efficiency; to provide hyper-links to other related sites; and to communicate upcoming events.

1.2 PROGRAM RATIONALE

The Upstream High-Efficiency Gas Water Heater Program that we are here proposing builds on the success of the program that we implemented for SoCalGas. With our considerable experience in planning, designing, and implementing the SoCalGas program, we have already gone through the expensive and time consuming part of the learning curve regarding the market for energy efficient gas water heaters. From our experience, we have a good understanding of the market for gas water heaters and how to stimulate the sales of high-efficiency gas water heaters. We have determined the promotional and sales tools that are most effective and have developed methods to increase the quality of trade ally participation and to ensure that they have the necessary tools to promote energy efficient gas water heaters. We have established relationship with wholesalers/distributors of gas water heaters in southern California and have well-developed approaches already in place for implementing the Upstream High-Efficiency Gas Water Heater Program in other areas of the state.

A major market barrier for sales of high efficiency gas water heaters, particularly for the replacement market, is that water heaters are often purchased under emergency circumstances. Households do not have time to research models of different efficiencies and often rely on the recommendation of the plumbing

contractor. The rationale for the Upstream High-Efficiency Gas Water Heater Program is that the most effective way to increase the sales of higher efficiency gas water heaters to households is by working with wholesaler/distributors to make installation of high efficiency gas water heaters more financially attractive to plumbing contractors. In our program for SoCalGas, we promoted high-efficiency gas water heaters by providing incentives to stock and sell such units to wholesalers/dealers, who in turn discounted the price of the units when selling them to plumbing contractors. Only water heaters sold for residential replacement purposes received the discounts; water heaters sold for new construction did not receive the discounts. Wholesalers/distributors also provided sales and marketing for the program.

Water heaters eligible for discounts under the proposed program must have energy factors of 0.61 or higher. Several factors underlie the decision to promote water heaters with these energy factors.

- Although the current standard for gas water heaters requires them to have an energy factor of 0.53 or higher, it is anticipated that the standard will increase the required energy factor to 0.60 in coming years. However, the 0.60 standard will not become effective until some time after 2005. Therefore, there is an opportunity to promote the higher efficiency water heaters even before the new standard level takes effect.
- Requiring water heaters to have an energy factor of at least 0.62 to be eligible for the program would have discriminated against some manufacturers who would not have an adequate number of qualifying units. Through the program, we can alert these manufacturers that in the future water heaters with higher efficiency will be incented. Indeed, in our program for SoCalGas, we first set the energy factor standard for eligibility at 0.60 but then increased it to 0.61. This has already alerted manufacturers that future incentives will be paid only for units with higher energy factors.

The core concept for the Upstream High Efficiency Gas Water Heater Program (i.e., to give incentives to wholesalers to lower the price of high efficiency units they sell to plumbing contractors) contrasts with the approach proposed by the utilities in their Statewide Residential Retrofit Single-Family Rebates Program. The utilities propose to offer homeowners rebates of $50 per unit for purchasing high efficiency gas water heaters. However, there is strong evidence from the Residential Contractor Program that rebates to individual homeowners do not have significant impacts; fewer than 100 high efficiency gas water heaters have been installed annually through the Residential Contractor Program. By contrast, our upstream program for SoCalGas to promote sales of high efficiency gas water

heaters resulted in the sales of more than 77,000 high-efficiency gas water heaters for installation in residential houses over a two-year effective period.

The incentives to wholesalers/distributors work because they make high efficiency gas water heaters the least expensive water heaters available to plumbing contractors. They also encourage wholesalers/distributors to change their inventory practices to have a higher proportion of high efficiency gas water heaters in stock. This strategy succeeds in getting the attention of the vast majority of plumbing contractors purchasing water heaters to replace old water heaters. The incentive payments made to the wholesalers encourage them to promote high efficiency water heaters to plumbers, increasing the market share of high efficiency units. Our experience with the SoCalGas program was that most of the large wholesale chains consistently advertised the plumber rebate in their regular publications. (See the example provided in the attachments, Section 10.)

1.3 PROGRAM OBJECTIVES

Table 1-1 provides summary information regarding the objectives of our proposed Upstream High-Efficiency Gas Water Heater Program.

Table 1-1. Proposal Summary for Upstream High-Efficiency Gas Water Heater Program

Program Name	Upstream High-Efficiency Gas Water Program
Program Category	Local Residential Programs
Budget	$2,164,267.00
TRC Ratio	8.02
PPT Ratio	16.36
Annual kWh Savings Target	N/A
Annual Peak kW Reduction Target	N/A
Annual Therm Savings Target	4,125,000 therms
Other Performance Targets	125,000 water heaters
Program Strategies	Upstream rebates for high efficiency gas water heaters
Target Market Segments	Residential Appliances

As shown by the summary data in Table 1-1 and by the rest of our proposal, the Upstream High-Efficiency Gas Water Heater Program satisfies various criteria that the CPUC has specified for local efficiency programs.

- It provides long-term annual gas savings by increasing the sales of higher efficiency gas water heaters that have an average life of 15 years.

- It is cost effective in the savings it provides per dollar of cost. The TRC is 8.02, and the PPT is 16.36. (These test results are documented in Section 4 and in the accompanying spreadsheet.)
- It addresses a major market barrier for improving energy efficiency for water heaters by making installation of high efficiency gas water heaters financially attractive to plumbing contractors, who are often the decision-makers on the types of water heaters installed in the residential replacement market.
- It is innovative, using an upstream marketing approach to make installation of higher efficiency gas water heaters more attractive to plumbing contractors.

2. PROGRAM PROCESS

Our process for the proposed Upstream High-Efficiency Gas Water Heater Program builds directly on the process and procedures that we used over several years in implementing a similar program in the service territory of Southern California Gas Company. We already have in place all of the personnel, equipment, and procedures needed to operate the Upstream High-Efficiency Gas Water Heater Program during PY 2002 and PY 2003.

Although we have procedures in place for implementing the Upstream High Efficiency Gas Water Heater Program, we do need to coordinate our work with that of the utilities and other parties who have programs directed towards promoting the sales of high efficiency water heaters. Accordingly, we prepare an implementation plan at the start of the program that specifies the process and procedures that we will be using to implement the program and to coordinate our work with that of others.

Our work effort in implementing the Upstream High Efficiency Gas Water Heater Program is divided among six (6) tasks, as follows:

- Task 1 is to conduct market research and program planning.
- Task 2 is to identify and qualify wholesalers/distributors for the programs.
- Task 3 is to train and support the wholesalers/distributors.
- Task 4 is to verify sales of water heaters through the program and make payments to wholesalers/distributors
- Task 5 is to use the program to promote high-efficiency gas water heaters.
- Task 6 is to coordinate the program with other partners.

2.1 TASK 1: CONDUCT MARKET RESEARCH AND PROGRAM PLANNING

As noted above, our program plan for the Upstream High Efficiency Gas Water Heater Program is based on the work that we have already accomplished in implementing an upstream gas water heater program in the service territory of Southern California Gas Company. We have already conducted considerable market research for that program (through focus groups and surveys) and have three years of actual experience in implementing and fine-tuning that program.

Our market research and program experience have revealed that the replacement market for gas water heaters has a variety of actors. The key players include manufacturers, distributors, wholesalers, retailers, plumbers, landlords and end-users. However, there are differences in the degree to which a program can influence these different players.

- While plumbers often have a central role in deciding on what gas water heaters to install, the research results indicate that focusing a program on them directly is not warranted. Traditionally, plumbers have purchased lower efficiency models because a greater price difference existed and because the exterior diameter of lower efficiency units is smaller, allowing easier installation in tight spaces. Plumbers do not want to carry a water heater to a job site and find out it won't fit, so they typically have carried low efficiency units to most job sites. Our market research work has indicated that if plumbers are required to handle much paperwork (e.g., if they are used as the central agents for the program), then their participation will be low. On the other hand, we also learned that plumbers will drive out of their way to purchase heaters from a wholesaler if a T-shirt, hat or BBQ lunch giveaway was happening.
- Our market research revealed that plumbing contractors working on new new construction projects generally install high efficiency water heaters to take advantage of Title 24 provisions. Accordingly, we have determined that no incentives should be paid for high efficiency water heaters being used in new construction projects.

In positive terms, our market research has revealed that the most effective way of affecting the water heater market is by working at the wholesale level. Based on the research, we have developed a program plan through which wholesalers participating in the Upstream High Efficiency Gas Water Heater Program are offered a $10 per water heater incentive to stock high efficiency gas water heaters (i.e., water heaters with energy factors of 0.61 or higher). Of this $10 incentive, $7 is to be passed along as an over-the-counter discount to the plumber and $3 can remain with the wholesaler to cover his administrative costs.

The amount of incentive that we propose to offer through the Upstream High Efficiency Gas Water Heater Program is based on our experience in implementing the program for SoCalGas.

- When that program started, we offered wholesalers a $30 per unit rebate for stocking gas water heaters with energy factors of 0.60 or higher, but with $20 of the rebate being passed on to plumbing contractors as an instant rebate when they purchased one of the higher efficiency units.
- During the second year of the program we were able to reduce the rebate to wholesalers to $22 per unit, again with the understanding that $15 of the rebate would be passed on to plumbing contractors as an instant rebate.
- By the third year of the program (i.e., the last half of 2001), the rebate that we offered to wholesalers was reduced to $10 per unit, with $7 being passed on to

plumbing contractors as an instant rebate. At the same time, the energy factor for a water heater to qualify for the rebates was raised to 0.61 or higher. In practice, the $7 rebate for water heaters with an energy factor of 0.61 or higher puts their cost to a plumbing contractor at about the same level as a water heater with an energy factor of 0.53.

By offering these rebates as incentives to wholesalers to lower prices on higher efficiency gas water heaters, we have been able to encourage plumbing contractors to purchase and install higher efficiency gas water heaters. According to participants in focus groups that we have conducted as part of the market research for our SoCalGas program, some plumbers are now being proactive in asking homeowners questions to determine whether they can install higher efficiency units (even in situations were space considerations previously were considered a limitation on using higher efficiency units).

2.2 TASK 2: RECRUIT WHOLESALERS/DISTRIBUTORS

One of the most critical aspects to having the Upstream High Efficiency Gas Water Heater Program succeed is to recruit a large number of wholesalers/distributors into the program.

To begin implementation of the program, we first compile lists of qualified wholesalers/distributors of gas water heaters. We compile this list using business directories and industry contacts that we have already developed. Through telephone calls and in-person visits (if necessary), we recruit and quality wholesalers/distributors for the program. The steps in our process of recruiting and qualifying wholesalers/distributors for the program are as follows:

- We send a program announcement to the wholesalers/distributors that we are targeting for the program.
- Once wholesalers/distributors have received the program announcement, they will have time to digest and broadcast the information. Because the wholesale/distribution market for gas water heaters is a relatively tight-knit community, it can be expected that the word will spread.
- We contact the prospective trade allies to secure a meeting with the decision maker. Contact strategies are employed to maximize the number of successful appointments. Strategies include tried-and-proven techniques for getting the appointment. Our personnel are trained to adhere to all customer service protocols (e.g., we remain courteous and never push).
- Concurrent with calling and setting up appointments with individual trade allies, we arrange for meetings with large buying groups or trade associations

to discuss cooperative presentation of the program to their regional members. Maximum program enthusiasm and exposure will be accomplished by echoing the news throughout the industry.

- Our experience has shown that some trade allies who are initially reluctant to participate because of perceived confidentiality issues become willing participants upon receiving an agreement in writing. Accordingly, we can proffer them the Statement of Confidentiality Agreement that we have prepared for the program.

Trade ally appointments are scheduled to ensure that the decision-maker is there on site and available to speak with our field representative when he visits. We tell the contact that we are confident they will find the program a benefit to their establishment. The recruitment presentation covers the following topics:

- Background of the program and its success in SoCalGas's service territory
- Why program is being implemented
- What the goals of the program are
- Structure of program
- Who is involved
- What the particular trade ally can expect to get from participating in the program
- What is expected of trade ally if he participates

Each wholesaler who signs up for the program is asked to sign a dealer enrollment form. Each wholesaler agreeing to participate signs a participation agreement and provides three months of past invoice data to develop a baseline of sales. Each participating wholesaler is provided with posters and flyers identifying the wholesaler as a participant in the program and indicating that the wholesaler is offering a $7 discount on qualified water heaters. These posters are designed to be placed in conspicuous areas that will be frequented by plumbers coming to the wholesaler to purchase water heaters (e.g., by the coffee and doughnuts, in will call). ADM's field representatives train the counter sales staff of each participating wholesaler on the program, and on how they are to track sales of high efficiency gas water heaters for verification.

2.3 TASK 3: TRAIN AND SUPPORT WHOLESALERS/DISTRIBUTORS

It is imperative that each wholesaler/distributor who participates in the program understands the scope of all associated features and benefits that the program and the technologies have to offer. We are therefore careful to make sure that each

wholesaler/distributor whom we recruit is thoroughly informed and trained on the program.

Our training and support strategy calls for assigning our field representative staff to make the initial contacts, to enlist the participation of the trade allies, to perform any required training, and to provide continued support. From working on the program for SoCalGas, our field staff are well prepared in their knowledge of and experience with implementing the program for trade allies. The fact that our field staff are intimately familiar with program issues will ensure the successful training and support of trade allies. This same experience will also be invaluable in ensuring that trade allies actively participate in the program.

The training of a participating wholesaler begins when our field representative makes the recruitment visit to the wholesaler. Upon a trade ally agreeing to participate, our field representative begins the training process right there, right then. Each field representative carries promotional materials, point-of purchase materials, and training aids with him/her on the dealer enlistment calls. This allows services to be immediately provided to newly recruited dealers and tends to help close the sale, provide immediate visible value, and establish an immediate positive and cooperative working relationship. This ability to perform initial training also reduces the number of training-related re-calls, thereby reducing program expense (labor and mileage).

For the training, our field representatives attempt to assemble all of the personnel who will be involved in promoting the program (e.g., counter sales staff). We recognize that this is not always appropriate and that trade ally personnel are not always available. In such cases we schedule another, firm date for conducting the training with the trade ally staff.

The quality and level of trade ally training is essential to the overall success of the program. It is the trade ally and their staff who ultimately have the ability to influence the buyer's purchase decision. It is not sufficient that this training merely contain the technical or procedural elements of the program. It must also be motivational in nature, convey the value of trade ally participation, focus on professional sales strategies, and provide trade allies with a real perception that the program will positively impact their business.

Our primary tool for training trade ally personnel is the "Program Training Manual." This manual also provides a ready reference for participant wholesalers who desire to resolve an issue about the program. We have already prepared this program training manual. We have also developed additional tools to

complement the training manual, such as agreements, forms, advertising information gathering tools, etc.

It is critical that the training be conducted by an experienced professional sales person. Wholesaler/distributor sales representatives are all professional salespersons who are likely to take direction only from someone they perceive to be knowledgeable and adept in sales techniques. Because of our experience with the SoCalGas program, however, our field personnel are well-equipped to work with the sales staff of a participating wholesaler.

Although the sales staff of small- to medium-size dealers often remains intact over many years, there can be substantial turn-over of the sales staff in larger establishments. This necessitates ongoing training for new personnel.

Continued visiting of participating trade allies is used to continually reinforce the message about high efficiency gas water heaters that the program is promoting. To deliver the "biggest bang for the buck" within a short time-frame and with limited funding, our strategy includes prioritizing the trade allies according to the support they warrant.

- We identify those trade allies that have the ability to provide the greatest impact for the program and target these dealers to receive on-going site visit support from our field personnel. For this higher priority segment, substantial visible presence and support is provided, especially in the early stages of this form of implementation, in order to ensure the consistency, quality, and effectiveness of their participation.
- For the other dealers who have lesser market presence, we use phone calls, mailings, and occasional visits to support their efforts.

Our operating guidelines for trade ally maintenance and support are aimed at focusing the trade ally towards properly using the program and promoting energy efficiency as one of the features and benefits of a gas water heater.

- During the first few months of new trade ally's participation, site visits occur more frequently. The visits serve several purposes, including training of sales personnel, placing of point-of-purchase displays, gathering information, coordinating of cooperative advertising placement (if appropriate), developing discount coupon utilization (if appropriate), and team building. By the end of the first few months, our field representative has developed a solid relationship with a trade ally and the sales personnel. The basic framework for the trade ally's participation in the program has been established, and a trade ally understands what is expected of them. They have also experienced the substantial support that they can expect from ADM.

- During the following months, the frequency with which we call on a trade ally is determined by the trade ally's level of participation. Regular routes are established to reduce travel time and mileage expense. During all trade ally visits, our representative handles any customer issues, checks for proper placement of point-of-purchase materials, determines whether or not new products may have been brought in, and if so, whether or not they are qualified for incentives. Representatives also check to see that all display stands are full and that all promotional material is in place. They review sales records (if appropriate) and obtain trade ally feedback.
- Attendant feedback from field personnel and a trade ally's level of enthusiasm will serve as a baseline by which to judge their level of acceptance, organization, effectiveness, and willingness to actively promote the program. Based on these criteria, the ongoing frequency of visits may be adjusted to compensate for the varying levels of "program enthusiasm" exhibited by each trade ally.

The goal of the ongoing maintenance and support effort is to narrow the differences in program delivery at the trade ally level by bringing low-end participants up to the high quality participation level of those trade allies who actively and enthusiastically embrace the program and its benefits. This also acts to provide trade allies with increased support at emphasis periods of the program.

Our budget projections, which are included in Section 9 of this proposal, are based on establishing a high level of trade ally participation. Our experience in implementing the program for SoCalGas demonstrates that the level of participation by trade allies is directly influenced by the level of support they receive early on in the program. We can certainly increase the number of trade allies addressed by reducing the number and length of calls on participating trade allies. However, we emphasize that our proposed program has a solid foundation on which to continue and grow, based on our work with water heater wholesalers/distributors in over 100 locations in southern California. Many of these wholesalers/distributors also have branches in northern California, to which we are now proposing to extend the program.

2.4 TASK 4: VERIFY PURCHASES AND MAKE INCENTIVE PAYMENTS

During the course of the program, an ADM field representative visits each participating wholesaler at least once a month to perform verifications, deliver point-of-purchase materials, answer questions, train new counter sales staff and create a sense of continued and thorough involvement. This repeated visiting helps create confidence in the program as well as discourages fraud.

From the perspective of the wholesalers/distributors who are the main trade allies for the program, the timeliness with which they receive the incentive payments for high-efficiency gas water heaters that they purchase is an important consideration. Accordingly, we make the incentive payments to a trade ally within 15 days of receiving their invoice confirming their purchase of qualified high-efficiency gas water heaters.

On signing onto the program, a wholesaler is paid the incentives on the current inventory, with the incentive payment effective the day prices are lowered to the plumber. Incentive payments continue to wholesalers as they submit their current manufacturer invoices, typically by fax. Payments are made within ten days of receiving the manufacturer invoices. Each wholesaler has to provide verification of discounting the water heaters to the plumber.

To verify purchases and to make incentive payments we use a process that has been tailored to accommodate the different needs of different types of wholesalers/distributors. Several options are made available.

- The most common method we use to verify purchases is through computer tracking. It has been our experience that most wholesalers can enter a specific line-item code in the computer every time a qualifying water heater is sold at discount. (As an example, a line-item code might be the existing model number with "REB" appended.) Verification simply consists of pulling a history of that specific code for a specific time period and totaling. This number has to match the quantity of heaters rebated by ADM.
- Some companies will be able to print and mail to ADM copies of every plumber invoice for every rebated water heater sold.
- For other companies, our field representative might view the plumber invoices on his regular visit. Again, these are totaled and compared with the quantity rebated by ADM.
- Companies with large, interstate corporate pricing structures find it difficult to modify their prices regionally. In the verification process that we have developed for these types of companies, we print voucher coupons that they pass out to qualified plumbing contractors upon sales of qualifying water heaters. The plumbing contractor submits the voucher to us for payment. Upon request, the plumber has to provide a customer invoice to ADM stating the high efficiency water heater was installed as a replacement item. Typically, plumbing contractors who specialize in replacements purchase one or two water heaters at a time. Purchases of five or more water heaters are investigated further to ensure that the purchases are not for new construction projects.

2.5 TASK 5: USE PROGRAM TO PROMOTE AND MARKET HIGH EFFICIENCY GAS WATER HEATERS

Task 5 is to use the Upstream High Efficiency Gas Water Heater Program to promote and market high efficiency gas water heaters. A major element of our intervention strategy pertains to marketing outreach. For the wholesalers and distributors, materials for the sales counters are provided, as well as materials oriented as outreach mechanism to their customers though mailings, invoicing, and quoting. Examples of the marketing and promotional materials that we have prepared in the past are included in Section 10, Attachments.

While we direct a significant amount of incentives towards the wholesalers / distributors to get them to lower the prices of high efficiency gas water heaters, our marketing outreach also goes out to plumbing contractors. We found in the program that we implemented for SoCalGas that informing plumbers about the availability of discounts for high efficiency gas water heaters and alerting them as to which wholesalers/distributors were offering the discounts set up market dynamics favorable to increasing the sales of the high efficiency units. Plumbers responded to the price and availability information by directing their purchases to the wholesalers/distributors participating in the program.

Another means of promotion is through having a booth at trade shows. At these shows we set up a promotional booth (in high traffic areas if possible) where we place the appropriate point-of-purchase and promotional materials. We also provide materials that identify the wholesalers/distributors who are participating in the program.

2.6 TASK 6: COORDINATE WITH OTHER PROGRAMS

While the greatest potential for changing the market is at the point where a plumber purchases a water heater from a wholesaler/distributor, there are alternative avenues and approaches that we consider for incorporation into our final program design. Task 6 therefore is to coordinate the effort for the Upstream High-Efficiency Gas Water Heater Program with other programs.

For example, outreach activities to manufacturers may also be made. From the management perspective, manufacturers will be contacted to communicate the overall program and higher level strategies. Our goal will be to coordinate any feasible activities, obtain feedback, and access manufacturer strategies. Where possible, we will co-sponsor customer and counter days with manufacturers and see that our marketing materials are distributed from their display booths. In addition, visits that our field representatives make to wholesalers/distributors will be coordinated with manufacturer representatives. This will facilitate a

relationship building process and will give our field personnel access to difficult trade allies.

3. CUSTOMER ELIGIBILITY

Households of course are the ultimate purchasers of gas water heaters. They purchase water heaters primarily to replace old water heaters. Only water heaters purchased for replacement purposes are eligible for incentives under the proposed Upstream High Efficiency Gas Water Heater Program.

Focusing the program on replacement purchases of water heaters targets most of the market for gas water heaters. That is, most purchases of gas water heaters represent a purchase to replace a failed water heater. In their work to support the revision of the NAECA standards for water heaters, Lawrence Berkeley Laboratory estimated that replacement purchases represent from 71% to 85% of nationwide water heater purchases. Data collected by Regional Economic Research as part of the Statewide Residential Efficiency Market Share Tracking Study indicated annual statewide sales of just over 885,000 gas water heaters, of which about 89 percent were for replacement purposes.

We focus the Upstream High Efficiency Gas Water Heater Program on water heater wholesalers/distributors serving the areas shown in Figure 3-1. These areas represent the service territories of utilities offering gas service (i.e., SoCalGas and PG&E).

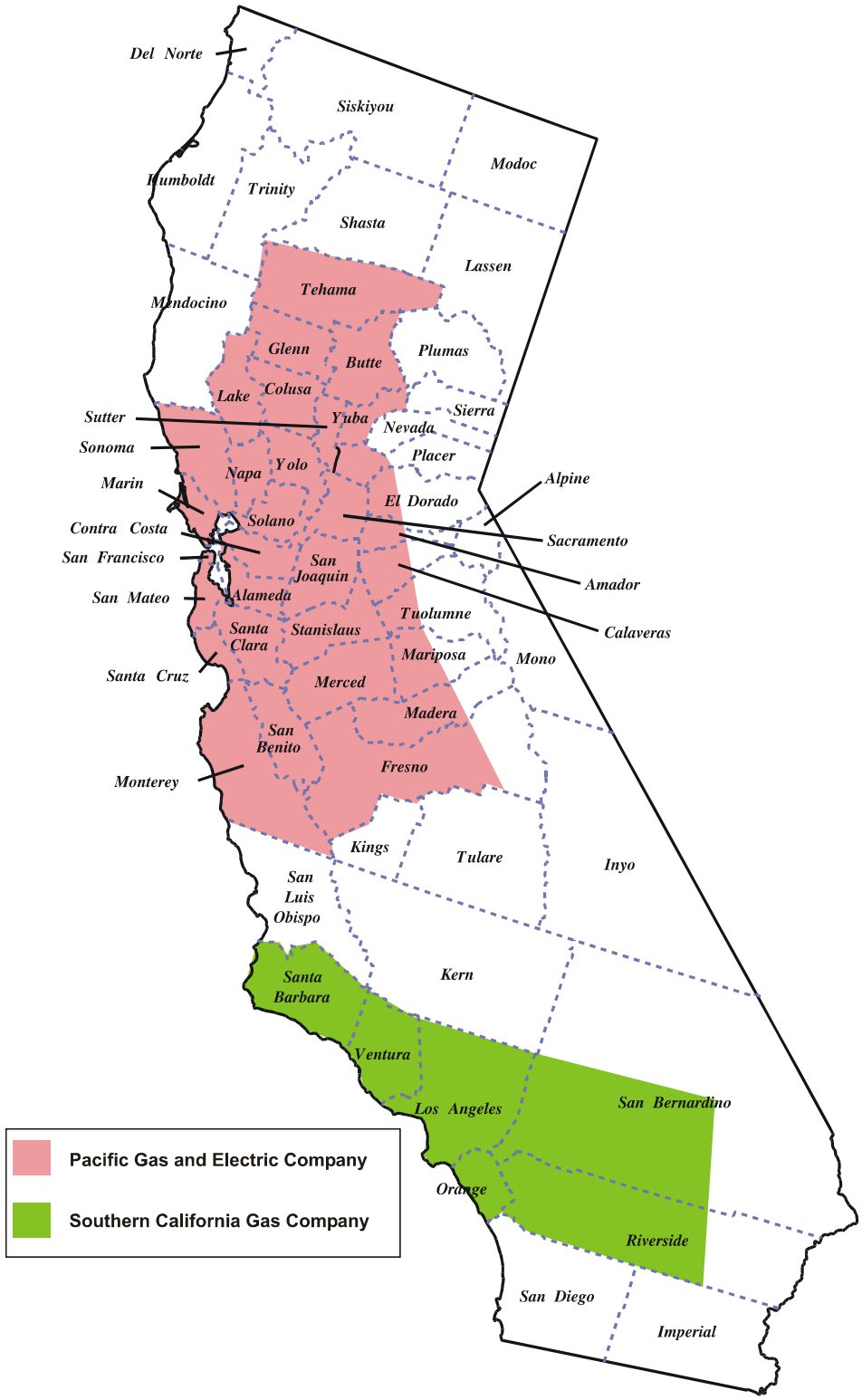

Figure 3-1. Areas Targeted for Upstream High Efficiency Gas Water Heater Program

4. COST-EFFECTIVENESS CALCULATIONS

We have used the cost-effectiveness spreadsheet provided by the CPUC to calculate the cost-effectiveness of the Upstream High Efficiency Gas Water Heater Program. The summary results from these calculations are reported in Table 4-1.

Table 4-1. Summary Results of Cost-Effectiveness Calculations for Upstream High Efficiency Gas Water Heater Program

Test	*Costs*	*Benefits*	*Ratio*	*Net Benefits*
TRC test	$1,914,267	$15,361,407	8.02	$13,447,140
Participant test	$1,250,000	$20,451,759	16.36	$19,201,759

For the calculations, it has been assumed that incentives will be paid for 125,000 high-efficiency gas water heater units. The average annual gas savings per water heater incented is 33 therms. The expected gas savings for the proposed program were determined using a baseline of 208 therms of gas use, which was obtained from the PG&E published Residential Saturation Survey, and a distribution of energy factors resulting from administering the Southern California Gas Co. High Efficiency Water Heater program during the last six months. These savings values are presented in Table 4-2.

Table 4-2. Savings For High-Efficiency Gas Water Heaters

Gas Water Heater Type	*Energy Factor*	*Usage Therms*	*Savings Therms*	*Anticipated Distribution*	*Weighted Savings Therms*
Baseline	0.53	208	-	-	--
High Efficiency	0.61	179	29.9	21%	6.3
High Efficiency	0.62	176	32.9	53%	17.4
High Efficiency	0.63	173	35.7	26%	9.4
				Average Savings	**33.0**

Table 4-3 presents water heater quantities and overall savings for each utility for the years 2002 and 2003.

Table 4-3. Overall Estimated Gas Savings

Year	*Utility*	*Quantity*	*Savings, Therms*
2002	Pacific Gas & Electric	15,000	495,000
	SoCal Gas	25,000	825,000
	Sub-Total	***40,000***	***1,320,000***
2003	Pacific Gas & Electric	35,000	1,155,000
	SoCal Gas	50,000	1,650,000
	Sub-Total	***85,000***	***2,805,000***
	Total	**125,000**	**4,125,000**

5. PROGRAM PERFORMANCE GOALS

The program performance goal for the Upstream High Efficiency Gas Water Heater Program is to provide incentives to encourage the sales of high efficiency gas water heaters (i.e., gas water heaters with energy factors of 0.61 or higher). The target numbers of high efficiency gas water heaters to be incented for different areas are shown in Table 5-1.

Table 5-1. Target Numbers of Water Heaters to be Incented

Utility Service Territory	***PY 2002***	***PY 2003***	***Total***
PG&E	15,000	35,000	50,000
SoCalGas	25,000	50,000	75,000
Total	40,000	85,000	125,000

6. EVALUATION, MEASUREMENT AND VERIFICATION PLANS

This section discusses our approach to performing the evaluation, measurement and verification work for the Upstream High Efficiency Gas Water Heater Program and to reporting on program progress.

6.1 APPROACH TO EVALUATION, MEASUREMENT AND VERIFICATION

As part of the implementation plan that we prepare for the Upstream High Efficiency Gas Water Heater Program, we prepare a plan for measuring and evaluating the program's effects, including the savings that result. Our preliminary outline of that plan is presented here. A more detailed plan would be prepared for the implementation plan.

We measure and evaluate the effects of the Upstream High Efficiency Gas Water Heater Program using several types of indicators. Most immediately, we assess the number of wholesalers/distributors who participate in the program and the number of water heaters incented for these dealers. We collect these data using the tracking system discussed in Section 6.2. We also use the tracking system to collect information about the characteristics of the water heaters being incented (e.g., model number, size, energy factor) that we use to calculate and assess the energy savings that can be attributed to the program.

To verify the data that we will have gathered from wholesalers/distributors regarding the types of water heaters they are stocking and selling to plumbing contractors, we conduct a telephone survey of a sample of plumbing contractors to obtain additional quantitative information regarding the numbers and types of water heaters they have been installing. We also use the telephone survey to identify factors that are important in affecting the decisions of plumbing contractors to encourage their customers to purchase high-efficiency gas water heaters when they need to replace an old water heater.

6.2 REPORTING REQUIREMENTS

Although we have procedures in place for implementing the Upstream High Efficiency Gas Water Heater Program, we do need to coordinate our work with that of the utilities and other parties who have programs that may also involve promoting energy efficiency for water heaters. Accordingly, we prepare an implementation plan at the start of the program that specifies the process and procedures that we will be using to implement the program and to coordinate our work with that of others. We submit this plan to the CPUC and the CPUC-designated contract manager for review and approval.

From our work in implementing and evaluating energy efficiency programs, we know the importance of having good information in a program tracking system in

order to track the progress of the program and to evaluate its effects. For the Upstream High Efficiency Gas Water Heater Program, we already have in place the system for tracking the work, based on the work for SoCalGas that we have conducted over the past several years. This tracking system is a full system that includes procedures, policies, protocols, forms, data entry and the data storage methods. The system is up and running and will require little modification to tailor it to meet the data collection and reporting requirements involved in our implementing of the Upstream High Efficiency Gas Water Heater Program.

We use the system to track specific types of information that enable us to evaluate the progress of the program and our efforts. The information that we track includes the following:

- Total number of participating wholesalers/distributors and other trade allies
- Brands of gas water heaters that they carry
- Sizes of gas water heaters that they carry
- Styles of gas water heaters that they carry (qualifying vs. non-qualifying)
- Total sales of qualifying products (size, brand, style, etc.)
- Total incentive payments by type
- All available information on impacts of the program, including anecdotal feedback from market actors.

We employ a file aging approach to track the length of time for processing incentive payments to participating wholesalers/distributors and to be able to accurately inform them about the status of their incentive requests. File aging will include the following dates:

- Date the information was entered into the database
- Date that a letter was sent for additional information (if necessary)
- Date that it was approved for payment
- Date that the check was sent

During the course of the program, we use the tracking system to prepare quarterly reports that detail the activities and progress towards meeting the goals of the program. Each quarterly report includes information on the number of water heaters incented and their characteristics (e.g., size, energy factor, etc.).

7. DESCRIPTION OF ADM'S QUALIFICATIONS

This section provides information on the qualifications of ADM Associates and of the personnel who will be the staff for the Upstream High Efficiency Gas Water Heater Program.

7.1 ADM'S QUALIFICATIONS

The Upstream High Efficiency Gas Water Heater Program that we are here proposing extends the program that ADM has been implementing for Southern California Gas Company since 1999. In our program for SoCalGas, we promoted high-efficiency gas water heaters (i.e., with energy factors of 0.61 or higher) by providing incentives to wholesalers/dealers to stock and sell such units, who in turn discounted the price of the units when selling them to plumbing contractors. Only water heaters sold for replacement purposes received the discounts; water heaters sold for new construction did not receive the discounts. Through this program we promoted the sales of more than 77,000 high-efficiency gas water heaters for installation in residential houses. (By contrast, fewer than 100 high efficiency gas water heaters were installed through the Residential Contractor Program, the other major program through which sales of high efficiency water heaters were promoted.)

ADM also has considerable experience in implementing other energy efficiency programs as well. Examples of this experience include the following:

- **Lodging Industry Energy Education Program**

  For: Southern California Gas Company

  Through the Lodging Industry Energy Education Program, ADM visited hotels/motels in SoCalGas's service territory and offered their operators hands-on assistance to identify ways in which they can improve energy efficiency and save energy in their facilities. The Lodging Industry Energy Education Program demonstrated that a hands-on approach is a very effective approach to getting small business owners to think about energy and to take actions to improve energy efficiency. We visited over 900 lodging facilities during 2000 and have visited over 400 more in 2001.

- **Beverage Vending Machine Program**

  For: Southern California Edison Company

  Under contract with SCE, we are implementing an Energy Savings Program for Beverage Vending Machines. We are installing VendingMisers™ or time clocks (as appropriate) on 3,400 vending machines in SCE's service territory. The control strategies are defined by (1) whether the vending machine is

lighted and (2) whether the location of the machine will permit use of a time clock or requires use of a VendingMiser™. Most of these savings will go to small commercial customers, who are a particular target for the program.

- **Duct Efficiency Programs**

  For: Pacific Gas and Electric
  Southern California Edison
  Southern California Gas
  San Diego Gas and Electric

  Under the California Board for Energy Efficiency's third party program, ADM was under contract with the four major investor-owned utilities in California (i.e., Pacific Gas and Electric, Southern California Edison, San Diego Gas and Electric, and Southern California Gas) to implement residential duct efficiency programs throughout California. The Duct Efficiency Programs were aimed at institutionalizing good duct design and establishing retrofit duct repair as a component of HVAC maintenance. Through the Duct Efficiency Program, we provided HVAC and/or sheet metal contractors with the information, procedures, and technologies that they could use to market duct leakage inspection and repair services to residential single-family and multi-family houses. Through the program, contractors were educated and trained on how to provide duct inspection and repair services as a viable business venture. Contractors were taught new techniques and procedures that were explicitly designed under this program in order to be effective and not too expensive. Contractors who participated in the programs were also assisted in identifying households who are interested in having their duct system inspected and repaired.

- **RCP Training**

  For: Southern California Gas
  Southern California Edison

  ADM is conducting training workshops to provide training to HVAC contractors to better equip them to participate in the Residential Contractors' Program. One aspect of the training is to provide training in central air conditioner/central heat pump diagnostic tune-up, duct testing and duct sealing in conjunction with SCE/SoCalGas Installation Standards. The other aspect is to provide an overview of the RCP fulfillment process from consideration of installation of energy efficiency measures through completion of work and contractor payment. This overview includes proper completion of program-related paperwork, including Incentive Voucher/Application and Customer Information and Declaration forms.

- **Local Energy Assistance Program**

  For: Southern California Edison
  Pacific Gas and Electric
  Southern California Gas

  ADM developed a program that we implemented throughout California to provide assistance to the planning departments in selected communities to encourage energy efficiency in new industrial and commercial developments that are being proposed in those communities. This program included directly influencing specific development plans and providing assistance to the planning departments of the local governments to plan/approve planing and zoning areas, based on energy use as well as other infrastructure criteria presently used. We also disseminated information regarding the results of these energy planning activities to other communities. Our program in California was funded at $1.2 million by the major utilities (i.e., Pacific Gas and Electric, Southern California Edison, and Southern California Gas).

- **Energy Efficiency Site Surveys of Commercial, Industrial, and Agricultural Facilities**

  For: Pacific Gas and Electric

  In this project for PG&E, we are conducting surveys of commercial, industrial, and agricultural customer facilities to identify and analyze the energy efficiency opportunities using the 1-2-3 tiered approach to energy conservation. For Tier 1, we identify and analyze the no-cost energy efficiency opportunities in each customer facility. For Tier 2, we identify and analyze the low-cost energy efficiency opportunities in each customer facility. For Tier 3, we identify and analyze customer facilities with a view to identifying energy efficiency opportunities that will require major financial investments on the part of the customers. All recommendations target and prioritize measures and technologies that deliver both immediate and long-term peak-period kW demand savings and annual kWh and therm savings.

- **Energy and Water Efficiency Services Support**

  For: Colorado Springs Utilities

  Under this contract with the City of Colorado Springs Utilities, ADM provided energy and water efficiency services for CSU's industrial and large commercial customers. We provided feasibility evaluations for energy and water efficiency projects and provided design plans for energy and water efficient projects. In addition, we provided training on energy and water efficiency projects for CSU staff.

- **Technical Support to Demand Side Management Unit**

  For: Jamaica Public Service Company, Ltd.

  Under a contract with the Jamaica Public Service Company, ADM is providing technical support to JPSCo's Demand Side Management Unit. We have provided a Resident Consultant who works with JPSCo staff in planning demand-side management programs for JPSCo's customers. Subject areas for which we are providing technical support include program planning and implementation, cogeneration feasibility studies, energy auditing, building codes, simulation modeling, monitoring, and program evaluation.

- **Technical Audits for Large Industrial Customers**

  For: Power Agency of California

  Under contract with the Power Agency of California, we conducted audits of large industrial electricity customers in order to identify appropriate energy efficiency improvements. To support this activity, we developed the audit form to be used in data collection, conducted on-site interviews of plant personnel on facility operations, collected other relevant data on-site, evaluated the collected data, and prepared engineering estimates of the energy savings for energy efficiency improvements for each of the audited facilities. Estimates of expected savings were developed through engineering calculations or through simulations with computerized energy analysis models.

- **Business Energy Advocates Program for Small Business**

  For: California Energy Extension Service

  ADM provided marketing and technical support services on energy conservation for a program to encourage small business firms in California to adopt techniques and technologies that reduce energy consumption and costs. The program was also intended to reduce the barriers encountered by business firms in gaining access to energy management techniques and practices. We identified energy conservation measures that are particularly applicable to given types of businesses and supported their applications for utility company incentive payments and low-interest small business loans.

- **Commercial Audits Project**

  For: Entergy Services, Inc.

  For Entergy, we performed the Commercial Audits Project. We performed on-site audits at about 650 commercial facilities throughout Entergy's service

area. Using the data collected through these audits, we prepared customer-specific DOE-2 analyses of energy savings from conservation measures. We prepared audit reports for the individual customers and also aggregated the data to prepare system-level estimates of the saturations of various end-use technologies and DSM measures.

- **Energy Audit Services for Small and Medium Commercial and Industrial Customers**

  For: El Paso Electric

  For El Paso Electric, ADM provided energy audit services to its small- and medium-size commercial and industrial customers. We conducted energy audits for approximately 250 small C&I customers and for approximately 75 medium C&I customers. The audit services included collecting data on-site, preparing an analysis of energy use and potential energy efficiency measures (using our *CPA 123* model), and preparing an audit report for each customer audited.

Our ability to inform owners/operators of small convenience stores about energy efficiency opportunities derives from our hands-on experience in collecting and analyzing data on energy use for commercial facilities.

- We have conducted energy audits on nearly 3,000 commercial and industrial facilities for such clients as Niagara Mohawk Power, Entergy Services, Northern States Power, El Paso Electric, Wisconsin Electric Power, Iowa Southern Utilities, Centerior Services Company, the Bonneville Power Administration. San Diego Gas and Electric, and Rochester Gas and Electric.
- We have conducted on-site surveys of nearly 10,000 commercial and industrial facilities for clients such as Entergy Services, Northern States Power, Union Electric, Central Illinois Public Service, Florida Power and Light, Alabama Power Company, El Paso Electric, the Bonneville Power Administration, Southern California Edison, Pacific Gas and Electric, the California Energy Commission, the Sacramento Municipal Utility District, San Diego Gas and Electric and other utility companies.

7.2 KEY PERSONNEL

This program requires expertise in market analysis and program design and implementation. Our team for this program provides these required capabilities.

- The principal point of contact between the CPUC's designated Contract Manager and the project team is ADM's project manager, Mr. Taghi Alereza. Mr. Alereza will provide overall technical leadership and will ensure that

excellent staff support will be available to the project. He will direct the program design efforts and will be responsible for liaison with the Contract Manager.

- Market analysis and research and measurement and evaluation activities will be directed by Dr. Donald Dohrmann, who is director of economic studies at ADM.
- The day-to-day program manager will be Dr. Richard Ely, who is a Senior Project Manager at ADM.

Short biographical sketches for these and other key personnel for the project are provided in the following paragraphs. Full resumes are provided in Section 10, Attachments.

Taghi Alereza, P.E., who is President of ADM, will be the Principal-in-Charge of the work. Mr. Alereza is a nationally recognized expert in building energy simulation and modeling. He has pioneered the development of several state-of-the-art simulation procedures and models. He developed the variable-base-degree-day method documented in the ASHRAE Handbook, and he was responsible for the development of the first hourly simulation model to operate on microcomputers. Mr. Alereza pioneered on-site data collection in 1975 for the Federal Energy Administration, and managed the first commercial sector on-site data collection effort in 1977 for the California Energy Commission. Over the past twenty-five years Mr. Alereza has directed numerous energy-related data collection and analysis projects for the SCE, PG&E, SDG&E, Southern California Gas Co., SMUD, the California Energy Commission, and various other utilities and public and private clients. He has been responsible for the on-site data collection and energy analysis of over 15,000 buildings, with a budget of over $20 million. Some of these specific projects include:

- Directed the Pacific Northwest Non-Residential Survey. The project was conducted in four states. Several utilities were involved, and the budget was over $1,900,000.
- Directed a non-residential survey and end-use monitoring for Entergy Services, Inc. The projects were conducted in four states, under four separate operating utility companies. The combined budget was $1,600,000.
- Directed non-residential surveys and retention studies for Southern California Edison, with a combined budget of over $1,800,000.

Mr. Alereza holds a Bachelor of Mechanical Engineering degree from Auburn University and has completed an MS and the coursework for D.Sc. in mechanical

engineering from the George Washington University. He is a member and past chairman of ASHRAE Technical Committee 9.6 (Energy Utilization), which is responsible for developing and applying protocols for assessing energy use in buildings, and the cognizant TC for the ASHRAE Standard 90.2. He is a registered professional engineer in California.

Richard Ely, Ph.D., is a Program Manager and Senior Economist/Engineer at ADM with responsibilities for energy analysis, program evaluation, and energy modeling. Dr. Ely will serve as the day-to-day project manager for this proposed program. He was a project director for an Upstream High Efficiency Water Heater program conducted for Southern California Gas Co. In this project, ADM promoted and provided incentives for over 77,000 high efficiency water heaters. Dr. Ely was responsible for coordination of the availability of water heaters with manufacturers and distributors. He also conducted focus groups with manufacturers, distributors and plumbing contractors to identify ways to increase the sales of high efficiency water heaters. Dr. Ely participated in recruiting participants for the LEAP project conducted for SCE and SCG. He has made presentations to local governments to promote the LEAP process. He has worked on electricity demand and rate analyses for the New England Energy Policy Staff, the New England Regional Commission, the New England Energy Policy Center, and several environmental organizations and has been a staff member of the Rhode Island Public Utilities Commission. Dr. Ely received a B.S. from Massachusetts Institute of Technology, a M.S. in engineering from the University of California, Berkeley, a M.S. in Resource Economics from the University of Rhode Island, and a M.A. in economics and a Ph.D. in Resource Economics from the University of Connecticut.

Dr. Donald Dohrmann is a Principal of ADM Associates and Director of Economic Studies. He is responsible for program design and marketing activities. Dr. Dohrmann has technical expertise in economics, survey design, and statistical analysis. He was responsible for preparing the designs and conducting the data analysis for surveys of building departments and homebuilders that ADM conducted during a Residential Building Standards Confidence and Sensitivity Study for the California Energy Commission. He has also developed and applied analytical methodologies for evaluating DSM programs, including evaluations of Portland General Electric's commercial new construction programs, Northern States Power's high efficiency motors and adjustable speed drives programs, Pacific Gas and Electric's Commercial New Construction Program and its Nonresidential Energy Management Services Programs. He has been responsible for designing the statistical sampling plans for surveys of households and commercial firms that ADM has conducted for various companies, including

Pacific Gas and Electric Company, Southern California Edison Company, the Bonneville Power Administration, Florida Power and Light, and other utilities. He has also been responsible for preparing and conducting the analysis of the data collected in these surveys. Dr. Dohrmann received his B. S. in economics from Iowa State University and his M. A. and Ph. D. in economics from Yale University.

Lon Smith is a Mechanical Engineer at ADM Associates, Inc., responsible for development and conducting training in the areas of HVAC systems. He has extensive experience in refrigeration, transport and control systems in residential, commercial and industrial buildings. During his previous employment of 20 years with United Refrigeration Inc., Honeywell Inc., and New England Sheet Metal Works, Inc., he has developed an exceptional understanding of not only the theoretical aspects of HVAC and refrigeration systems, but also he has mastered the practical side of these systems as well. In the past, he has provided consultation to HVAC designers, and has conducted training in refrigeration and control systems. Mr. Smith was an instructor at the State Center College District. He taught classes in pneumatic, electrical and electronic controls for commercial, residential and industrial mechanical systems. He has also taught classes on refrigerant types and their application, refrigerant recovery and power distribution systems, and their application to power line carrier transmissions. Some of the projects that Mr. Smith has been responsible for include:

- Upstream High Efficiency Water Heater Program, performed for Southern California Gas Co. Responsible for coordination of wholesalers, verification and payment.
- Mobile Energy Clinic, performed for Southern California Gas Co. Development of procedures and conducting training of field staff.

Mr. Smith is a licensed Energy Auditor for the Environmental Protection Agency and the California Energy Commission. He earned his Bachelor of Arts in Communications from California State University Fresno.

Cyrus Davehlo is a Mechanical Engineer at ADM. For the past ten years, Mr. Davehlo has been a field engineer and trainer for the surveys of residential, commercial and industrial customers that ADM has conducted for Georgia Power, Alabama Power, Wisconsin Electric Power, Northern States Power, Portland General Electric, and many other utilities. He will be participating in on-site data collection and end use monitoring of lighting and supply fans. He has personally collected on-site data for over 1,500 buildings in the last ten years. In this work, he has collected data on industrial processes, HVAC and lighting systems in a

wide variety of commercial and industrial facilities. Examples of specific projects that Mr. Davehlo has participated in include:

- Conducted on-site data collection for two major commercial saturation studies conducted for Florida Power and Light Co.
- Conducted on-site data collection and energy audits of commercial buildings for El Paso Electric Co.
- Conducted on-site data collection for non-residential buildings for two projects conducted for Northeast Utilities.
- Conducted on-site data collection for energy audits conducted in Arkansas, Louisiana, Mississippi and Texas for Entergy Services Co.

Mr. Davehlo graduated from Florida Atlantic University with a B.S. degree in Mechanical Engineering.

Richard Burkhart serves as the Senior Technical Editor and desktop publisher at ADM Associates, Inc. As technical editor, his responsibilities include copy-editing, graphic design and production for documentation, marketing materials, survey questionnaires, and web page layout and design for ADM projects. He is responsible for the production of a quarterly newsletter and accompanying website for the Southern California Gas Co. *Lodging Industry Education Program*. He was in charge of designing and publishing marketing materials for the Duct Efficiency Training Program, Upstream High-Efficiency Gas Water Heater program and several other energy efficiency marketing programs performed for California utilities. He was responsible for the production of a series of Commercial / Industrial site audit reports for Entergy Services, Inc. For Kansas City Power and Light Co. he developed automated templates using the data linking functions in Microsoft Word and Excel to generate site reports, and was responsible for final copyediting and cleanup of the reports. He has also performed similar work for projects for Southern California Edison Co. He is well versed in the advanced techniques for a wide variety of production software packages and web page design software, under multiple operating systems. Prior to joining ADM, he worked as a freelance editing assistant, performing editing, graphic production and page layout for a series of operating manuals for computerized production equipment. Mr. Burkhart earned his B.A. degree in Communications from California State University, Fullerton.

Gary Friedlander is a field representative and surveyor at ADM Associates, Inc. He has been participating in the High Efficiency Gas Water Heater program that ADM is implementing for Southern California Gas Co. Mr. Friedlander conducts training, makes follow-up visits to the wholesalers, and performs verification of

sales and stocking practices of the participating wholesalers. Mr. Friedlander also participated in a statewide project to collect information on energy using equipment in the common areas of multi-family housing facilities and condominiums. He conducted interviews and collected detailed audit data on size and efficiency factors for swimming pool, laundry, water heater, outdoor/indoor lighting, and other equipment in the common areas of multi-family housing locations. Mr. Friedlander obtained a BA degree from New York University.

8. TIMELINE FOR PROGRAM IMPLEMENTATION

Our proposed timeline for implementing the Upstream High Efficiency Gas Water Heater Program is shown in Table 8-1.

Table 8-1. Timeline for Implementing Upstream High Efficiency Gas Water Heater Program

Activity	***Target Date***
Program Begins	5 Days After Contract Approval
Program Implementation Plan	3 Weeks After Project Start Date
Evaluation, Measurement & Verification Plan	5 Weeks After Contract Approval
First Quarter Report	3.5 Months After Contract Approval
Second Quarter Report	Quarterly
Third Quarter Report	Quarterly
Fourth Quarter Report	Quarterly
Fifth Quarter Report	Quarterly
Sixth Quarter Report	Quarterly
Program Completion	December 2003

9. PROGRAM COST PROPOSAL

Our cost proposal for the Upstream High Efficiency Gas Water Heater Program is detailed in Table 9-1.

Table 9-1. Budget Summary

Item	First Year Cost	Second Year Cost	Total Cost
Administrative Costs			
Labor	$ 215,677	$ 458,313	$ 673,990
Benefits			$ -
Overhead			$ -
Travel costs	$ 7,040	$ 14,960	$ 22,000
Reporting costs		$ -	$ -
Materials & Handling	$ 5,920	$ 12,580	$ 18,500
General and Administrative costs	$ 23,635	$ 50,225	$ 73,860
Subcontractor costs (include same line items)			$ -
IOU Administrative Fee (only for non-IOU programs)	$ 32,613	$ 69,304	$ 101,917
Direct Implementation Costs			
Itemized (may be estimated) - 125,000 @ 10/unit	$ 400,000	$ 850,000	$ 1,250,000
Evaluation, Measurement and Verification Costs			
Direct labor		$ 24,000	$ 24,000
Other direct costs	$ -	$ -	$ -
Other Costs			
TOTAL BUDGET	$ 684,885	$ 1,479,382	$ 2,164,267

The budget allocation by program year and utility service territory is shown in Table 9-2.

Table 9-2. Budget Allocation by Utility Service Territory

Utility Service Territory	*PY 2002*	*PY 2003*	*Total*
Pacific Gas & Electric	$ 256,832	$ 609,158	$ 865,990
Southern California Gas	$ 428,053	$ 870,224	$ 1,298,277
Total	$ 684,885	$ 1,479,382	$ 2,164,267

Our proposed payment schedule is shown in Table 9-3.

Table 9-3. Proposed Payment Schedule

#	***Event***	***% Payment***
1	Acceptance Of Final Program Implementation Plan	25%
2	Acceptance Of Evaluation, Measurement And Verification Plan	10%
3	Acceptance Of Quarterly Reports (Payments To Be Determined Proportional To The Number Of Implementations Performed)	50%
4	Final Payment Based On Evaluation, Measurement And Verification Results	15%

10. ATTACHMENTS

Taghi Alereza
Principal & Director of Engineering

Mr. Alereza, a Principal of ADM Associates, Inc. and Director of the Engineering Division, is a recognized expert in energy analysis, energy modeling, energy forecasting, and system evaluation. He has been responsible for the development of several state-of-the-art contributions in the energy modeling field. These contributions have centered on energy analysis and energy forecasting for the residential, commercial, and industrial sectors. During his 25 years of professional experience, Mr. Alereza has successfully managed highly technical projects for over thirty major utility companies, the Department of Energy, California Energy Commission, and Electric Power Research Institute.

California Statewide Programs

Mr. Alereza has led ADM's effort to develop and implement two statewide residential programs during the 1998 program year. He conceived and developed the "Residential Duct Efficiency Program," which was implemented in the service territories of Pacific Gas and Electric, Southern California Edison, Southern California Gas and San Diego Gas and Electric. Mr. Alereza directed the development of the procedures for duct leakage tests and repairs, the training curriculum for HVAC contractors, marketing materials and program evaluation protocols. The Duct Repair program is being considered as an item with the most amount of incentives in the 1999 residential SPC program. Mr. Alereza also conceived the Local Energy Assistance Program (LEAP), which was implemented in the PG&E, SCE and SCG service areas. This program provided extensive training to developer/builders, local government staff and elected officials.

Program Evaluation

Mr. Alereza has managed several commercial, industrial and residential impact evaluations for Detroit Edison, Portland General Electric, Pacific Gas and Electric, Delmarva Power, BC Hydro, and Consumers Power Company. ADM designed the sample for participants and non-participants, collected the data, prepared baseline simulations of HVAC energy use, evaluated the energy impacts of the programs, and conducted all metering-related work, including installing, maintaining and removing metering equipment, collecting and verifying metered data on energy use and using these data to calibrate procedures for simulating such energy use.

Mr. Alereza has also managed various new construction evaluations for Pacific Gas and Electric, San Diego Gas and Electric, Southern California Edison Company and BC Hydro. ADM assessed the actual (realized) impact of several post-implementation program parameters, first-year annual energy savings, load shape impacts, net-to-gross and persistence impacts, incremental customer equipment and installation costs, and total customers' costs.

Pacific Gas and Electric's Commercial New Construction Program entailed an evaluation of realized savings for participant and non-participants using data on building equipment and characteristics; economic and attitudinal characteristics of the businesses involved; and billing and/or end-use metered data. In addition, monitoring equipment was installed in a subsample of the buildings to measure end-use electricity under "as operated" conditions.

ADM Associates provided analysis of the impacts of SDG&E, SCE and BC Hydro's energy efficiency programs. We conducted more than 300 high-resolution on-site surveys and correlated the results to billing data and local weather data. SDG&E and SCE's evaluations included additional parametric runs compared the energy use of the buildings under Title 24 conditions, as-built conditions and per incentivized measures. The data from the decision makers' survey was combined with the results of the DOE-2 parametric analysis to perform the overall net-to-gross analysis.

End Use Metering

Mr. Alereza has been the principal-in-charge on monitoring projects that collected data from more than 500 buildings in various locations.

He is currently managing Phase I and Phase II of an end-use metering project for Entergy Services Inc. ADM is performing this project to provide baseline end-use information for commercial buildings in Entergy's service area. We are installing monitoring equipment at 40 commercial buildings throughout Entergy's four-state service area and will be collecting end-use data from these buildings over the next year. End uses being monitored include space heating, air conditioning, and lighting, as well as end uses important in particular types of buildings (e.g., refrigeration in grocery stores).

As part of Pacific Gas & Electric Company's Collaborative Process program verification efforts, ADM conducted short-term monitoring of end uses in commercial and industrial buildings, both before and after conservation measure implementation. Data were analyzed to identify actual energy savings associated with each end use at each site and included in a comprehensive summary report prepared for each site. For Southern California Edison, ADM provided technical support for end-use metering of 50 commercial buildings. For San Diego Gas & Electric Company, ADM conducted its commercial end use and thermal storage monitoring project. We installed data acquisition systems at over 100 selected buildings with chillers and/or thermal storage systems in SDG&E's service territory. For all projects, ADM was responsible for recruiting the buildings for the program, preparing the meter installation plan, verifying the meter installation, and for validating the end-use data collected. Data validation is accomplished using our Load Profile Viewer, a custom-designed software program for reviewing and validating end-use load profile data. Installed equipment included current transformers, Btu meters, flow meters and temperature sensors.

He was responsible for the development of Data Analysis and Reporting System (DARS), a microcomputer software package that graphically displays metered end-use load data. DARS was developed as a coordinated set of SAS (Statistical Analysis System) programs that can extract end use load data from a mainframe data base and prepare the data for analysis and reporting. For simple reporting purposes, DARS can produce daily load profile plots, percent energy distribution pie charts, and energy distribution bar charts. For data analysis, DARS can produce load profile plots for various options, including individual site plots, plots for distributions across monitored sites, and plots for weighted averages across sites.

Industrial End-Use Data Analysis

Mr. Alereza managed two major industrial data collection and DSM evaluation projects for Bonneville Power Administration and Wisconsin Electric Power Company. The BPA project included development of a comprehensive database of available industrial DSM measures and their impact on industrial energy use by end-use. The WEPCO project included development of data collection procedures and collection of detailed industrial end-use inventory for 150 industrial facilities in Wisconsin. Also included in this project is a detailed analysis of end-use and process energy use and development of an industrial end-use analysis model.

Commercial Building End-Use Energy Data Collection and Analysis

For the past 15 years, Mr. Alereza has been responsible for data collection and analysis of several thousand commercial facilities throughout the United States. He has managed two major data collection and analysis projects on non-residential buildings for the Bonneville Power Administration. He has managed similar projects for many utilities including Pacific Gas & Electric Company, Southern California Edison Company, San Diego Gas & Electric Company, Florida Power & Light, Alabama Power, Rochester Gas & Electric Company and Union Electric. He has also been responsible for the development of several analysis models being used by many researchers.

Simplified Calculation Method (SCM)

Mr. Alereza developed the Simplified Calculation Method (SCM) which is the commercial building energy standard compliance tool for the California Energy Commission. The concept used in SCM was based on the variable-based degree-day method which was originally developed by Mr. Alereza for the National Bureau of Standards. The SCM provides capabilities for analysis of daylighting, evaporative coolers, and solar water heaters.

Building Energy Use Determination

Mr. Alereza was the program manager on a program which resulted in the development of a methodology for determining energy use in residential and commercial buildings in the U.S. Army facilities. This methodology employs

non-computerized procedures and renders computer approach accuracy without the cost and the effort involved in the computer simulation. He was a major contributor to a program which evaluated the correlation between building component structure and energy consumption in new and old residential buildings in the Baltimore/Washington area in 1972. The analysis techniques and concepts developed in this program were expanded and served as a basis for a similar evaluation of single- and multi-family housing in 10 geographic regions of the United States. Mr. Alereza was the principal investigator on this program, and his responsibilities included the technical direction of tasks which defined typical buildings for each location, determined their energy consumption patterns, and evaluated the energy savings that could be achieved through selected structural modifications.

Building Infiltration Measurement and Modeling

Mr. Alereza had participated in several outdoor air infiltration and ventilation studies. He modified and extensively used the infiltration model developed by the National Research Council of Canada to develop a simplified hourly infiltration model. He also developed another air infiltration model which calculates the outside air infiltration into residential buildings as a function of the building characteristics, wind velocity, and indoor/outdoor temperature differential. The parameters for this model were evaluated by using SF6 Tracer gas decay rates in residences in Baltimore, Chicago, Denver, St. Louis, and Washington, D.C. Later, this model was used to assess the indoor air quality as a function of outdoor air quality and the air change rate.

Commercial Electricity Demand Forecasting

Mr. Alereza was the program manager and a key technical contributor for a project which resulted in the development of an electricity energy use and demand forecasting model for the California commercial sector. Also included in this project was an inventory of physical and energy use characteristics of existing buildings and end-use devices in the commercial sector. This inventory was obtained through three phases of data acquisition: a mail survey, an on-site inventory survey, and spot metering of end-use devices.

Energy Use Patterns Analysis

Mr. Alereza provided technical support in the development of a comprehensive methodology for analyzing energy use patterns for conservation potential at the community level, an evaluation of the impact of time-of-day price structures on commercial and industrial sectors, the development of a regional commercial sector energy forecasting model, evaluation of hot water energy use in hospitals, and an assessment of energy use and energy conservation potentials in public buildings.

Solar Energy Driven Rankine Cycle Engines

Mr. Alereza has also been active in the solar energy field. He was a key contributor to a program which assessed the feasibility of utilizing Rankine cycle engines and absorption cycle equipment for the cooling of buildings. He contributed to nearly every phase of the study which addressed working fluids, solar collectors, and heat sinks as well as a comparative evaluation of the Solar Rankine Cycle, Solar Assisted Rankine Cycle, and Solar Absorption cooling concepts.

Publications

Mr. Alereza has authored over twenty research papers which he has presented to the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE). He has also served as the technical committee (TC) chairman on energy utilization. This committee is the cognizant TC for development of measurement and verification protocols being developed jointly by DOE and ASHRAE. He is the author of, or a principle contributor to, over 50 technical papers or major reports in the areas of energy analysis, energy conservation, and energy forecasting.

Some of the projects to which Mr. Alereza has been a principal technical contributor include:

- Conducting Survey of 500 Commercial Establishments in California, California Energy Commission
- Conducting Survey and Performing EUI Calculations for 60 Commercial Buildings, Southern California
- Conducting Survey of 400 Commercial Buildings in Baltimore, MD, Federal Energy Administration
- Development of Typical Commercial Buildings in California, California Energy Commission
- Development of Building Energy Standards for Residential and Commercial Buildings, State of Alaska
- Development of Non-Computerized Methodology for Building Energy Analysis, U.S. Army Construction Engineering Research Laboratory
- Evaluation of Residential Energy Consumption and Assessment of Technical Innovations Enabling Reduction of Energy Consumption, U.S Department of Housing and Urban Development
- Development of Variable-Based Degree-Day Energy Calculation Method, National Bureau of Standards
- Energy Use and Electricity Demand Forecasting for the Commercial Sector, Electric Power Research Institute
- Comprehensive Community Planning for Energy Management and Conservation, U.S. Energy Research and Development Administration
- Energy Analysis for the South Florida Region, South Florida Regional Planning Council

- Hot Water Usage in Hospitals, Lawrence Berkeley Laboratory

Prior to forming ADM Associates, Inc., Mr. Alereza was Program Manager of the Western Office of Hittman Associates, Inc.

Mr. Alereza is a graduate from Auburn University with a Bachelor of Mechanical Engineering (B.M.E.), and has completed M.S. and the coursework for a D.Sc. in Mechanical Engineering at George Washington University. Mr. Alereza is a Registered Professional Engineer in the State of California.

Donald R. Dohrmann, Ph.D.
Principal & Director of Economics Studies

Dr. Dohrmann, a Principal of ADM Associates and Director of the Economics Studies Division, has 25 years of business and academic experience in economic analysis, survey design, and statistical analysis. He has also been responsible for evaluating the economic viability of new energy conservation technologies and preparing forecasts of the commercial acceptance of these technologies. He has considerable experience in designing studies to collect data on energy use by commercial firms and households, in analyzing the economic factors affecting the choice of energy-using technologies for commercial, industrial and residential buildings, and in forecasting the acceptance of conservation measures for such buildings. He has been the Principal Investigator on several studies that involved designing and executing surveys to collect data on the factors affecting energy use by commercial firms and households. He has been a primary contributor to the development of end-use demand forecasting models for the commercial sector.

Survey Design

Dr. Dohrmann's experience in designing surveys includes:

- For the Bonneville Power Administration, he was the Principal Investigator on a study in which a survey was conducted to collect data on the prices and energy efficiencies on residential appliances. The data collected were formatted into a database for BPA's use in formulating programs to encourage households to choose energy efficient appliances.
- For the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE), he has been the pricipal investigator on two research projects to conduct nationwide surveys to collect and analyze data on the maintenance costs of HVAC equipment.
- For the Electric Power Research Institute, he was the Principal Investigator for a study that evaluated sample survey techniques for collecting end-use data on commercial customers of electric utilities.
- For the Pacific Gas and Electric Company, he prepared the sampling plan for conducting an on-site survey of 675 of PG&E's commercial customers.
- For the California Energy Commission, he evaluated and prepared sampling plans for conducting on-site surveys of nearly 900 commercial customers of Pacific Gas and Electric Company, Southern California Edison Company, and the Sacramento Municipal Utility District.
- For the Sacramento Municipal Utility District, he designed and drew the sample for a mail survey to collect data on the saturations of residential appliances.
- For the California Energy Commission, he was a primary contributor on a project to develop common sampling methodologies that utilities in California can use to conduct mail surveys of their residential and commercial customers.

Energy Technology Economics

Dr. Dohrmann also has conducted a number of studies in which the economic viability of new energy using technologies was assessed. These studies include:

- Preparing an analysis of the economics and market potential of producing hydrogen through coal gasification and through electrolysis.
- Estimating the market potential of newly developed solar cooling technologies.
- Analyzing the economic factors affecting the future equipment needs of electric utilities.
- Estimating the market potential for compressed air storage systems among electric utilities.
- Evaluating the market potential for repowering steam electric generating plants with gas turbines.

Energy Conservation & Load Management

Dr. Dohrmann has conducted several studies in which energy conservation and load management measures were analyzed and evaluated. Examples of the studies include:

- For the U.S. Department of Energy and the Electric Power Research Institute, he analyzed the impacts of time-of-day electricity rates on commercial and industrial firms. He was directly responsible for the design of the sampling methodology used to select 300 industrial and commercial firms for on-site interviews and for the design of the questionnaire used during the interview.
- For the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE), he analyzed the costs of maintaining heating, ventilating and air conditioning equipment in office buildings. The data for this analysis were collected through a nationwide mail survey of office buildings that was conducted in conjunction with the Building Owners and Managers Association, International.
- For a major west cost utility, he analyzed the persistence of selected conservation measures among the utility's residential customers.
- For Lawrence Berkeley Laboratory, he conducted an econometric analysis to estimate fuel choice elasticities for the residential sector.
- For the State of Alaska, he evaluated the economics of energy efficiency performance standards for residential and commercial buildings in the state.

Demand Forecasting

Dr. Dohrmann has been a principal contributor on several projects to develop econometric/engineering models for forecasting the demand for electricity and natural gas in the commercial sector.

- For the Electric Power Research Institute, he prepared a report evaluating alternative methods for forecasting additions to the floorspace of different kinds of commercial buildings.

- For the Pacific Northwest Power Planning Council, he prepared an evaluation of different end-use models for forecasting energy use in the commercial and industrial sectors.
- For the California Municipal Utilities Association, he developed the specifications for simplified end-use forecasting models for the residential and commercial sectors.

Before becoming a Principal at ADM Associates, Inc., Dr. Dohrmann worked at Hittman Associates, Inc. and at the Research Center of United Technologies Corporation. He has taught economics at Yale University, the University of San Francisco, the University of Connecticut, and California State University, Sacramento.

Dr. Dohrmann graduated from Iowa State University with a B.S. in Economics. He received his M.A. and Ph.D. in Economics from Yale University.

Richard D. Ely, Ph.D.
Director

Dr. Ely's responsibilities include directing ADM's activities in the areas of developing, new energy efficiency programs, R&D, domestic and international marketing, and developing and managing several large distributed generation projects. Additionally, his responsibilities include innovative project management, energy market modeling, and forecasting.

He was a project director for an Upstream High Efficiency Water Heater program conducted for Southern California Gas Co. In this project, ADM promoted and provided incentives for over 77,000 high efficiency water heaters. Dr. Ely was responsible for coordination of the availability of water heaters with manufacturers and distributors. He also conducted focus groups with manufacturers, distributors and plumbing contractors to identify ways to increase the sales of high efficiency water heaters.

Dr. Ely has performed economic and environmental analyses for state, regional, and stake holding groups. He has worked on electricity demand and rate analyses for the New England Energy Policy Staff, the New England Regional Commission, the New England Energy Policy Center, Inc., and a variety of environmental organizations. He designed marginal cost rate structures with Ernst and Ernst, and worked with the New England Electric System to establish the first marginal cost rates in New England.

He has developed innovative energy efficiency programs for numerous utilities. He initiated the third party process for non-utility DSM projects in California, and he, participated on numerous energy efficiency and direct access working groups and committees. He has helped create and manage projects that bring together end-users, regulators, retailers and other market actors throughout the US.

He has organized field studies on public response in New Hampshire and Los Angeles. Dr. Ely has worked extensively on the supply side as an engineer, equipment manufacturer, and currently as an IPP near Watertown, New York. Independently and with ADM, he put together coalitions to supply green power to LADWP, and is currently active in design integrated DSM/TOU systems that are responsive to direct ISO control.

Dr. Ely received his BS from MIT, his MS in Engineering from the University of California at Berkeley, a MS in Resource Economics from the University of Rhode Island, and a MA in Economics and a Ph.D. in Resource Economics from the University of Connecticut

Richard Burkhart
Technical Editor

Mr. Burkhart serves as ADM's Senior Technical Editor and desktop publisher.

His responsibilities include copy-editing, production and graphic design for reports and proposals, and designing and publishing marketing materials for the Duct Efficiency Training Program, Upstream High-Efficiency Gas Water Heater program and several other energy efficiency marketing programs.

He was also responsible for the production of a series of Commercial / Industrial site audit reports for *Entergy Services, Inc.* For *Kansas City Power and Light Co.* he developed automated templates using data linking functions between Microsoft Word and Excel to generate site reports, and was responsible for final copyediting and cleanup of the reports. He has also performed similar work for projects for *Southern California Edison Co.*

He is expert in the advanced techniques for a wide variety of software packages, including Microsoft Office 97 / 2000, Aldus Pagemaker 6.5, graphics arts packages such as Corel Draw 8 and Aldus Freehand, and in various World Wide Web page design software.

Prior to joining ADM, he worked as a freelance editing assistant, performing editing, graphic production and page layout for a series of operating manuals for computerized production equipment.

Mr. Burkhart earned his B.A. degree in Communications from California State University, Fullerton.

Gary Friedlander
Field Representative / Surveyor

Mr. Friedlander is a field representative and surveyor at ADM Associates, Inc.

He has been participating in the High Efficiency Gas Water Heater program that ADM is implementing for Southern California Gas Co. Mr. Friedlander conducts training, makes follow-up visits to the wholesalers, and performs verification of sales and stocking practices of the participating wholesalers.

Mr. Friedlander also participated in a statewide project to collect information on energy using equipment in the common areas of multi-family housing facilities and condominiums. He conducted interviews and collected detailed audit data on size and efficiency factors for swimming pool, laundry, water heater, outdoor/indoor lighting, and other equipment in the common areas of multi-family housing locations.

Mr. Friedlander has earned a B.A. from New York University

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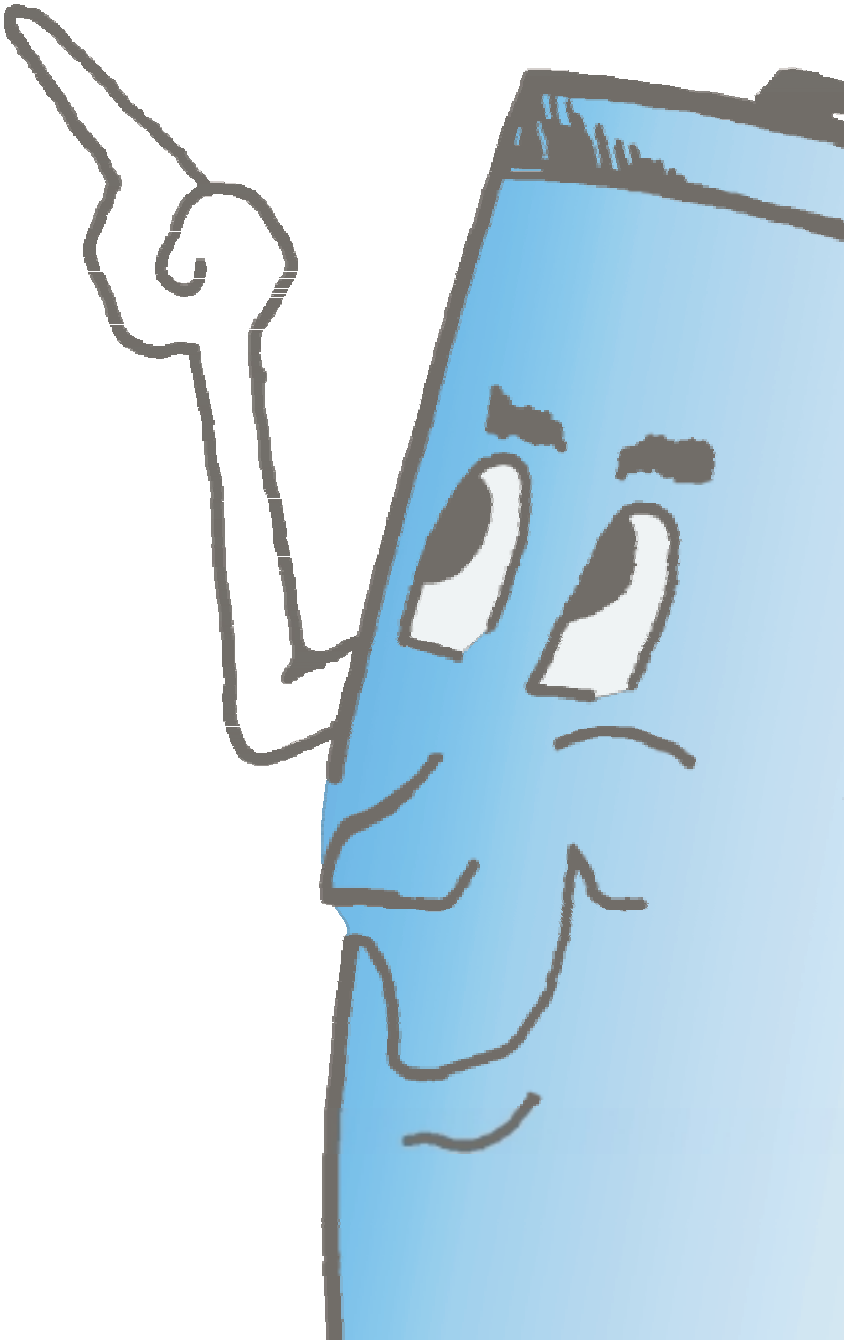

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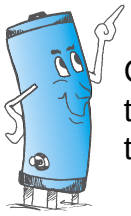

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Are you getting your *$15* Instant Rebate on High-Efficiency Water Heaters? Ask your wholesaler - *you should be!*

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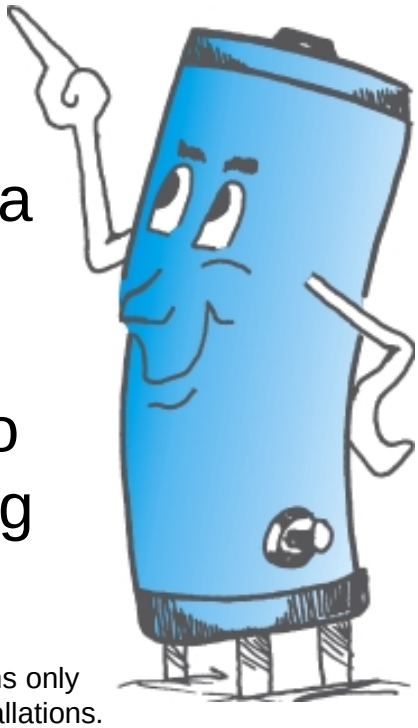
Rancho Cordova, CA

The cheapest gas water heaters are High-Efficiency units! (*after instant rebate*)

Ask your wholesaler for High Efficiency Gas Water Heaters and get a *$15* Instant Rebate.



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